

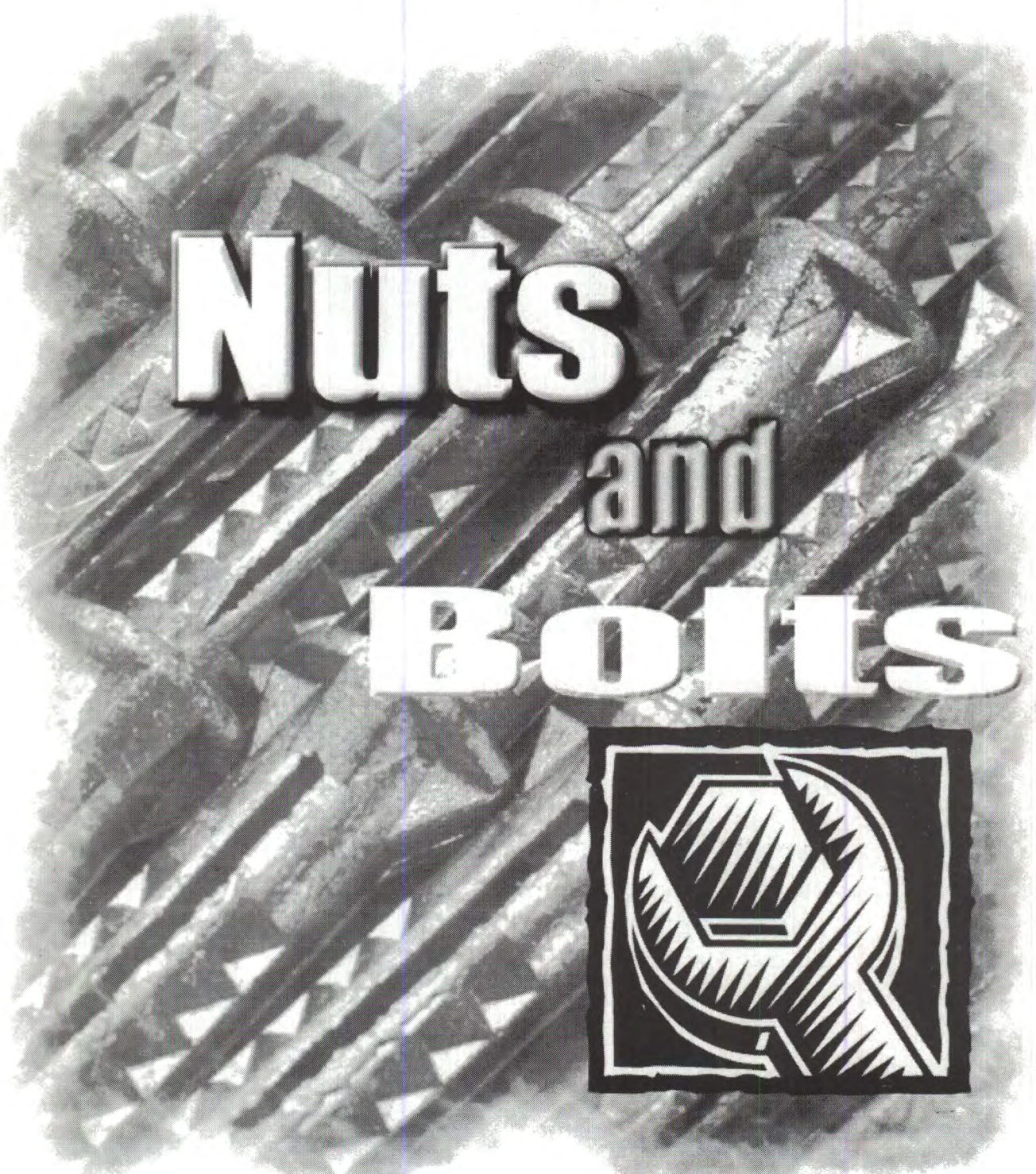
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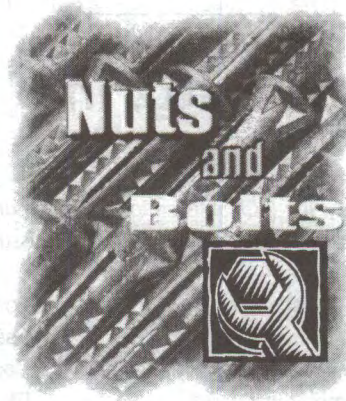
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extended attributes is the award winning monthly magazine of the Phoenix OS/2 Society, Inc.

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Indelible Blue survey results

by Bill Schindler, Editor-in-chief

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The two pie charts below show the results from a survey done by Indelible Blue, Inc (www.indelible-blue.com).

Because the conversion from color to grayscale may make some of the results unclear, here's the percentage breakdowns.

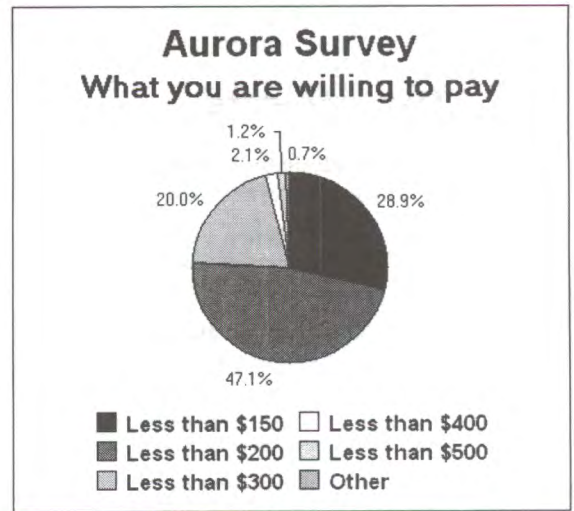
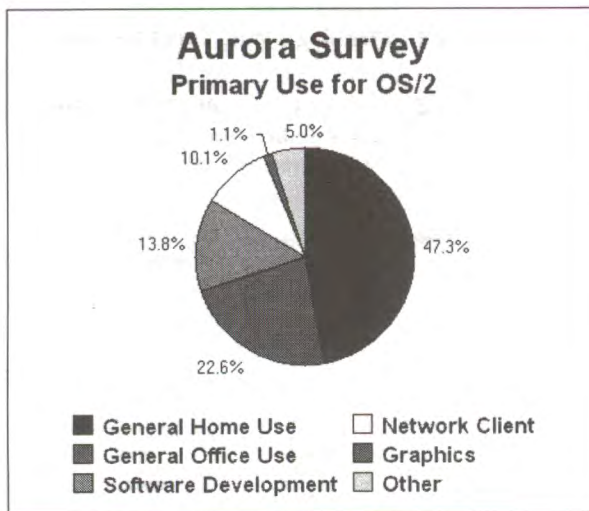
Primary use for OS/2:

- General home use: 47.3%
- General office use: 22.6%
- Software development: 13.8%
- Network client: 10.1%

- Graphics: 1.1%
- Other: 5.0%

What are you willing to pay:

- Less than \$150: 28.9%
- Less than \$200: 47.1%
- Less than \$300: 20.0%
- Less than \$400: 2.1%
- Less than \$500: 1.2%
- Other: 0.7%



Phoenix OS/2 Society, Inc

The Phoenix OS/2 Society, Inc (POSSI) is an international organization of computer users with an interest in IBM's OS/2 operating system and related issues.

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Letters



Letters to the editor should be sent to editor@possi.org or mailed to the Phoenix OS/2 Society. We reserve the right to edit all letters for content, readability, and length.

Wowza!

Just got the February issue of *extended attributes* and stumbled across the most useful hardware article in a coon's age.

"Choosing A Display Card For OS/2 And Linux," by Rhodes Hileman, condensed into two pages information that I've been spending weeks dredging up (with minimal success) and is far more informative than most of the information that I've been seeing on the Internet.

If you're in the market for new and replacement video hardware, this is an absolutely must read article.

It has probably save me much time in further research and a bundle of money for what was about to be a costly mistake.

Glenn E. George

I am very happy to see my piece published in *extended attributes*. Your magazine is as good as everyone said.

One regret: the acknowledgement of Andrew Madden for his *Red Herring* article "Shoot-out in 3D," January '99, got dropped when the sidebar was cut. The "News and Rumors" and "Industry Environment" sections of my story leaned heavily on his article. I felt I should acknowledge his work. The URL of his article is www.redherring.com/mag/issue62/shoot.htm1. Otherwise I am very pleased that you ran the article as written.

I read Esther Schindler's piece on voice recognition. I am one user who has been waiting for this technology to mature. I hate to type. I am distressed to hear you suggest that someday we may ask "Whatever became of it?" If the technology is really in danger of being dropped, I'm going to have to get serious about promoting it. I had been figuring it would blossom when it was ready, and when the hardware horsepower was cheap enough.

I agree that editing is still best done on screen, and I don't mind that. I imagine using a pointing device to place the cursor or highlight a string that's needing change, then just speaking the change. A little typing is not so bad when writing something at your desk, typing the corrections.

There are many places where a keyboard is not really feasible, or at least not handy: on a forklift in a warehouse, in a police car while giving chase, flying an airplane when on approach or in a busy ATC, walking in a forest or field, taking notes on your observations, etc. The "grail" I have been watching for is a wearable computer that can listen to you and speak to you, and not require a backpack with a car battery to do it.

Rhodes Hileman

I feel compelled to relate my experience with House/2. When you hear how it works for my business, you can imagine what it can do in your home.

I am a partner in a retail lighting business. In lighting stores, the ceiling lights are usually controlled by pull switches, and wall fixtures are controlled by banks of regular switches or rows of relay-controlled low voltage systems. During the design of our new Scottsdale location last year, I decided to automate the hundreds of ceiling and wall fixtures on display.

I used a PLC (power-line carrier) system to control every electrical device in the building. Control signals are sent through the electrical wire. Every light fixture to be controlled has an "intelligent switch" mounted either in place of a wall switch or (as we did) using small modules that fit into the fixture junction boxes. Wall plug receptacles are replaced with intelligent receptacles.

These modules are available at Radio Shack, Home Depot, or at discounted prices on the 'Net. Prices are \$5 to \$20, depending on the type of load they control.

Using House/2, you create *virtual* switches on your desktop. Each switch has a moving slide and display showing percent of intensity. Instead of depending on light sensors for outdoor lights and neon signs, you enter your geographic location and sunset/sunrise are calculated. After you configure all the controls, the data is downloaded into the interface. OS/2 workstations located throughout the showroom control the lights. We've been in operation for eight months now, without a single problem with the software's stability or dependability.

House/2 worked great except for one problem. The original versions had 192 possible unique controls. We quickly used them all up. Armin, House/2's author, wrote the software for home automation and the chances of anyone needing more than 192 switches for their home is slim. While at Warpstock, I told Armin that we had run out of switches. He said he would work on it—and here it is. Now a total of 288 devices can be controlled from your desktop!

I feel like this software was custom written for our specific use—for \$35! I would like to sincerely thank Armin for this program, and also urge you to download the demo of House/2 and try it out. The value can't be matched—at any price.

Lumature is an example of a small business running 100% OS/2 Warp 4 workstations and Server Advanced. If anyone is interested in a first hand demonstration of this system, I welcome you to visit our showroom at 15620 N Scottsdale Rd, Scottsdale, Arizona.

Mark Kerzner

Inner secrets of the IBM Works database

by Pavel Otavsky

.feature

When IBM released OS/2 Warp 3, the company attempted to make the system attractive to small office and home users. To make OS/2 useful, right out of the box, IBM included several applications in the BonusPak. One of them, IBM Works, is a fully integrated office suite. Its database component can handle a small business' needs; if the business grows, IBM Works database can export and import dBase, CSV (comma separated values), and TSV (tab separated values) formats.

Unfortunately, it's hard to take advantage of this gem. IBM Works has no printed manual, and the help system is not good enough to guide a new user. So, in this article, I'll explain how you can create a new database, and print reports and labels.

The IBM Works menu system is very context sensitive; the choices shown depend on the mode you're working in. You switch frequently from form design mode to data entry mode, and from report edit mode to report view mode. Though somewhat confusing initially, the context sensitivity quickly becomes very helpful. The user interface can be modified by turning the icon ribbons and toolbars on or off from the menu choices **View > Ribbons > Formatting | Operations**.

Creating a form

Let's prepare a small nontrivial database for your imaginary or real household pets. To make it more interesting, let's include information such as species (text field), name (text), gender (logical), birth (date), death (date) and age (calculated). With only a few records, you'll be able to try all the functions, including sorting and reporting.

Start IBM Works. Select **Database** and then click on **New**. A dialog box pops up, asking if you want to use an existing or new database. Why? Because IBM Works starts with the design of a new *form*. Once you have a database, you can design different forms and select fields from the existing database, and present different kinds of information separately.

At this point select **Create New...** and click **OK**. The **Insert Field** box is presented—and now things get more interesting.

You start by naming the new field. The name must start with a letter, it can only contain letters, numbers and underline, and it must be ten characters or fewer. As soon as the first character of the name is entered, the accumulation box at the bottom becomes active. Click on **Add** to add the field to the box, with default properties or your modifications; that makes the Field Name entry active again.

Repeat this cycle until all fields are named and defined. You can modify the field properties by selecting the fields in the collection box and clicking on **Update**.

During this process, you need to define the type of field. If it is a date field, the valid range is from 1931/01/01 to 2030/12/31, and all other dates are forced into it. To create a calculated field, you use a calculator box to create the formula using numbers, operators and existing fields, so do this one last. Defaults can be defined now, and even restrictions on what can be entered.

Clicking on **Save** commits all fields, closes the dialog box, and takes us to the blank form. The cursor is now a rectangle with a plus (+) inside.

Don't do anything but click somewhere close to the top edge of the form to drop all fields in place at once. Doing anything else, like re-sizing the window, will return the cursor to the arrow; the fields that you designed with care will seem lost. They are there—sort of. If you save the form, all of the fields are in the bottom left corner, on top of one other, and they have to be dragged from the pile and sorted out manually.

If you switch from form design to data mode, you will be asked to give this form/database a name.

After you drop fields on the form, you can turn on the grid in **Options > Grid Settings...** and select the grid size. Then move the fields and their names on the form, and finish their placement. The grid shows as a pattern of dots. The top left corners of the fields snap to the nearest point. Initially, the field and its name can be moved as a pair, but later on, they can only be moved separately. This is where a very helpful feature called *grouping* comes into play. With shift+LB (left button) click, you can select multiple objects and group them (**Edit > Group**, or one of a pair of icons in the tool bar) or break them up.

Form design can be enhanced in many ways, with different fonts, styles (predefined or custom), colors, borders, etc. Double clicking on the text opens the "Text Tool" and the field names can be made more descriptive if needed. Mouse RB (right button) pops up a menu that works on objects selected with the LB.

The "Pattern" menu item is confusing; it really means color density. Low density makes fill colors transparent. You can achieve very neat effects with this feature. **View > Draw Palette** turns on a complete drawing toolbox. Experimenting with this palette can be fun, and I encourage you to do so. You can align multiple selections using **Options > Alignment**, or the RB popup menu. Proceed with caution, since some alignments may pile objects on top of each

other, and they'll have to be dragged apart manually.

Before you enter real data, you may want to modify the field entry order. Accomplish this with **Options > Entry Order...** while still in Form design mode. Then you can select each field, and move it up or down with the arrow keys.

Entering data

Switch to the data entry mode (**File > Edit Data**, or LB click on the Data icon in the toolbar) and save the modifications. There is a new active button at the top, the **Add** button. Press that, and start filling the fields with information. Or just LB click on any field and start typing. As soon as you start, the **Add** button changes to **Accept**, and **Cancel** becomes active. After entering the information for one record, LB click on **Accept**. At this point you either continue with another record, or LB click on **Cancel** to exit the data entry mode.

You navigate the database by LB clicking on the buttons in the ribbon, or by using the menu **Record**. Turning on the status bar at the bottom (**View > Status Bar**) allows you to see which record number you are viewing. Each record has a number; until sorting is done, it represents the order of entry.

Sorting and selecting

The record order can be altered by changing the order from **Natural** to **Sort (Organize > Change Sort Order...)**. The fields used for sorting are selected in the left box and moved to the right box; their order can be changed by selecting the field and using the up and down buttons. The sorting order can be either ascending or descending.

If you exit the application after applying sort order, IBM Works will ask if you want to sort the database on disk, or defer sorting. Once the database proper has been sorted, the record numbers on the status bar correspond to the sort order. If the sort order is changed and all criteria removed from the sort box, the existing order becomes the natural one.

Sorting by index is another way to maintain order, and it has many advantages. It does not force sorting of the database proper, and there can be as many indexes as desired. You start that with **Organize > Create Index...** The mechanics are the same as with database sorting, but you must provide a name for each index. The index is applied to the database by **Organize > Select Index...** then selecting a name from the list. The name of the active index is displayed on the status bar, always in upper case.

Most of the time, you don't need to deal with the whole database. Selecting a subset is done with **Record > Specify Record Select...** and the dialog box offers a complete set of tools. The selection can be turned on and off by **Record > Use Record Select**. Unfortunately, when a selection is applied, the status bar still shows the total number of all records, not the total of those selected. To count them, we have to go further and do some reporting.

Reports and list view

Reports are lists of records, made from the whole database or from a selection, arranged by rows (records) and columns (selected fields) and grouped, with group summaries and breaks between groups and report summaries.

To start a new report, choose **Report > New...** The report form opens in the Edit mode, with the editing tools in the upper half of it and a sample view in the lower half. All database fields are listed in the left box. The fields of interest need to be moved to the middle box, and their order changed by selecting them and moving up or down. The report design form allows you to format every element, including fonts, sizes, text attributes, text alignment, borders, and column width. The report edit window's status bar indicates the sort order or index name, and the database file you're working with—but unfortunately, only the 8.3 name.

Up to three field names can be moved to the right hand box for the purpose of

grouping the lines (records). The buttons below the box select the breaks for the highlighted field, and they are from left to right: page break, one line break and no break. The next one, the circle with slash, is the suppress icon. LB clicking on these icons places their miniature on the selected field name lines. The two buttons to the right are the buttons that open a dialog box for group summary or report summary. To access these features, choose **Options > Summary Options...** **Options > Titles/Labels...** lets you construct and place headers and footers. The actual text has to be edited by double clicking on it in the Edit view of the report form.

You can create (and suppress) summaries for each column. Select the column heading, then click on either the group summary or report summary, and select any of the three options: total, average, or count. If the information in the logical fields seems corrupted, don't panic—the report changes custom inputs, such as C/B (good/bad) into T/F (true/false).

The list view is basically a report on the whole database, with all fields selected, presented in the order of the database sorting and with the report summary suppressed. You can use the list view as a starting point for building a report. Instead of building up the report by adding fields, you can do so by removing fields from the list in the middle box.

Labels, anyone?

This important function is hard to find but easy to use. A label is basically a form created for an existing database. Use **File > New...**, then select **Database, New**.

Use your existing database, but make a new form. Label setup is related to page setup, so that's where you find it. **Options > Page Setup** opens a dialog box with page size and orientation. Clicking on **Labels** opens a layout box, wherein you define the rows and columns and the "gutter" (the unusable space between the labels). Click on **OK** and finish the page layout, paying

continued on page 13

Aurora again

David reports his experiences with the Aurora beta

by David Both

.two warped

One of the very old SCSI drives on my Warp Server system crashed; I decided to take advantage of that fact and install Aurora, the beta version of Warp Server for e-business, and try the new Journaled File System (JFS). I actually decided to write this column as I began the epic adventure of installing a beta level operating system on my primary production server, so I do not yet know what the outcome will be. We shall go there together.

New beginnings

Because I installed Aurora over an existing server and some of my existing drives need to be kept intact, the initial boot of the three diskettes resulted in a single message on the screen. Aurora had created three compatibility volumes, and would I please reboot. No indication was given that the compatibility volumes were being created, nor was there an indication that this *must* be done in order to proceed with the rest of the installation. I understood that, but not everyone will.

There are now three format options during installation instead of just two: Do not format, Long format, and Quick format. I always format the boot partition when installing OS/2 Warp or Warp Server. It gets rid of any lingering file system problems or inconsistencies. I choose the long format because it actually gets rid of the files on the hard drive and prevents later problems with recovering unwanted older files when using CHKDSK. In previous versions it was necessary to press F3 to get to a command prompt and then change to the `.. \DISK_2` directory on the CD-ROM to perform a long format. This new option is much easier and very welcome.

The installation procedure does not allow you to format the boot partition with Journaled File System because the JFS file system is not bootable. The only choices here are FAT and HPFS. I recommend *always* using HPFS for the boot partition. In fact I recommend *never* using FAT on any partition for any reason. You can check out my reasons for this in my "DataBook for OS/2 Warp" on my Web site at www.millennium-technology.com.

Unfortunately the long format takes, well..., a long time and there is still no progress indicator. Should I just get a cup of hot chocolate or go to lunch? One advantage of manually formatting from the command line is its progress indicator.

The second (graphical) part of the installation recognized my Matrox video adapter. Just to see how that would work I allowed it to install the Matrox drivers. I normally recommend that you install the basic VGA drivers during

the installation and then go back and install high resolution drivers when the installation is complete.

Code pages

There is a new installation choice of primary and alternate code pages. The default is 437 as primary with 850 as the alternate. The only other choice for the US is 850 as primary with 437 as the alternate. Choosing other countries on this menu gives you other choices, usually with code page 850 as the primary or alternate. In addition, if you choose a country that is a member of the European Economic Union, you have the choice of using the "Euro Locale" which provides the Euro as the currency option.

Even if you choose the US as the Locale, there is an opportunity to install Thai, Greek, Korean, traditional and simplified Chinese, Japanese, Arabic, and other optional fonts. This is wonderful for many bilingual users and has been needed for some time.

The Unicode font is installed by default because all file and directory names are stored in Unicode by the Journaled File System. This ensures that directory sorts are consistent regardless of the code page used for user interactions, i.e., screen and printer fonts.

The JFS is installed by default, but can be deselected by punching the "System Components" button on the Setup and Installation menu.

SMP support can be installed, but the SMP kernel runs a bit slower on a single processor system than does the uniprocessor kernel. You can use Selective Install to add it later if you desire, so feel free to install the Uniprocessor kernel now if you only have a single processor.

I installed JFS but not SMP.

After installation

After the installation completed I ran into several problems.

The first was that the installation procedure had incorrectly identified my Etherlink III XL NIC. I could not persuade the MPTS configuration to see the drivers on the diskette I had, but that problem also occurs with previous versions of OS/2 so is not new. The solution is to perform a selective install and configure the NIC during that process.

I also ran into lots of hangs after I switched into high resolution mode. It looks like the Matrox drivers supplied with Warp Server for e-business still need some work. I installed the latest unified driver from the Matrox web site to correct that problem. The current set of GRADD drivers also work extremely well on the Matrox adapters. Next time I go back to installing the VGA drivers first.

NT Server Administration

After installing Warp Server for e-business, I installed Windows NT Server 4.0 on another computer borrowed for the purpose.

It is not clear from the current hard copy documentation whether an NT Server can be a backup domain controller or whether it must be an additional (standalone in NT terminology) server. I chose to make the NT server a standalone server.

The procedure to make the NT Server and its resources accessibility to the OS/2 domain is fairly straightforward if a little time consuming.

I made the NT server a member of a workgroup during installation rather than the OS/2 domain. After installation of NT Server, I installed the "IBM Networks User Accounts Manager" software from the Warp Server for e-business CD-ROM.

It is necessary to add an ID for the NT server on the Warp Server domain controller. This is the same requirement for OS/2 servers, each of which must also have an ID created for them. At this point I made the NT server a member of the OS/2 domain.

All this is somewhat confusing, but fortunately the directions are all in the on-line book, "Network Administration Guide." Instructions are *not* in the hard copy documentation supplied with the beta code, but hopefully will be included in the final version.

When installing the IBM Networks User Accounts Manager on the NT server, you can specify certain groups and/or accounts that are not to be synchronized with the domain controller. Likewise, a complete synchronization with the domain controller can be requested. These options are not mutually exclusive. The complete synchronization is used to initialize the NT user accounts database. I selected select this option and restarted the NT server.

The installation procedure creates an ID on the NT server called IBMLogon. This administrative account is used by the Warp Server to synchronize the user and group

accounts. After rebooting the NT server, allow the IBM account manager a few minutes to synchronize the user database.

Once the synchronization has occurred, I could see in the User Manager for Domains that all of the user accounts and groups that existed on my OS/2 domain had been replicated to the NT server. At this point any shared resources located on the NT server would be accessible by OS/2 domain users with appropriate access permissions.

Warp Server for e-business contains the equivalent of the NT browser service. On the Domain Controller, this service acts as the master browser for the domain. I can

now log on to any NT workstation with a Warp domain account using the local logon and see the OS/2 domain resources in the Network Neighborhood folder.

To be continued. . .

This is not the end. Next month I will discuss the Logical Volume Manager (LVM) and some more reasons I love being on the Bleeding Edge of technology! ☺

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Shareware success, Part II

What's it take to create a successful shareware application?

by Thomas Bradford

.feature

Last month, I wrote about the shareware's role in the OS/2 community. This second installment is primarily for shareware authors interested in learning what comes after compiling the code and creating an order form.

Success has many yardsticks. I won't tell you what a program has to achieve in order to be considered successful. That question can truly only be answered by the program author. However, in my time as a shareware distributor I've identified two traits that shareware authors have in common:

- Every shareware author would be thrilled to have as many people as possible using and talking about his program.
- Every shareware author that goes to the effort of putting an order form somewhere in the program hopes to make as much money as possible.

To be a successful shareware author, you need to do more than write good code.

(Well, that's not *entirely* true. You might write a program that a large company will license. Or you may be inundated with calls from venture capitalists offering money for the next big push. These things do happen. But also remember that every month ordinary housewives and regular guys win tens of millions of dollars in state lotteries.)

The odds are stacked in such a way that if you do your marketing homework and if you come up with the right product, and if you release it at the right time you might be successful. How? Let's get rolling!

The following are the most fundamental issues for creating a good shareware program.

Rule 1. Pick a category that really needs an application. Use care, here, because some product categories are saturated with a wide variety of excellent choices and/or mature proven products. That's not to say there isn't room for one more good program, but the more products you compete against the more difficult it is to succeed financially. If you want as many registrations as possible, it helps to pick a product that people *have* to have, or even better, will *have* to have three months from now. Being able to see what's coming and getting there first is the closest you'll get to guaranteed success.

Rule 2. Finish your application completely. As obvious as this sounds, a surprising amount of "almost good" shareware is released. It's the attention to the last 5% of development that separates a great program from a good one.

This is a common mistake. You've worked on the program 16 hours a day for 14 months. All of the bugs a normal user would encounter are squashed, but you secretly can crash the program every time if you want.

Rule 3. Write a help file. There are three good reasons: support, time, and money. If you write a program, your users will need help. A help file lets you address your users' concerns and (hopefully) allows them to find the answers quickly. It's a very common occurrence for someone evaluating a program to move on to another program because of a minor configuration issue or a little problem that could have easily been addressed if only a help file had explained matters.

Don't assume that no one reads the help file; it only seems that way. (By "help file" I mean a compiled INF help file for PM applications, not a collection of ASCII files with strange names like ATIDRV.TXT.)

In short, a help file can mean the difference between *.* and \$\$\$.

Rule 4. Polish your program before you release it. You should have at least a small team of beta testers to help locate and identify coding errors, bugs, and assorted weird behavior. Don't forget the spell checker for your documentation. Find someone who knows just enough about computers to be dangerous and let him install the application while you watch. Keep an eye out for areas where you made assumptions based on your familiarity with the program; they don't carry over to someone who hasn't compiled and run the program 14,323 times in the last two weeks.

Marketing? Oh no!

Ok Thomas, I've got a program, now what?

You've got a program. You registered your Web site with Yahoo. Time to sit back and wait on the mailman to bring the checks! Does that sound absurd? You spent a significant part of your life writing a program and now you're passively waiting for customers to find it. Something is missing. The missing ingredient is, of course, Marketing.

You can do it!

Many developers feel incapable of doing the marketing work to promote their programs. While a lot can be said with regard to realizing one's limitations, anyone with the ability to write a program can pull off a basic marketing plan. It's something that most developers dread, but I've never figured out why. In fact, marketing can be a lot of fun. We market every day and aren't conscious of it. We're all marketers, some are just more attuned to it than others. So, get over the idea you can't do it. There are a wealth of resources to guide you along each step of the way.

I recommend you start by looking at the marketing strategy of a larger company with a similar product. You probably don't have the marketing budget of a Fortune 500

company but you can read their marketing plan by looking at what they're doing. I'm not saying that you can do what they do, or that you should imitate someone else's marketing plan. Your mission is to identify your customers. In the process you will see how someone else handled the similar situations.

Understand the plan

Once you have a marketing strategy in mind be sure you understand it. Try to explain it to someone else. A good marketing plan is not nebulous and vague; it's sharp and focused. Write it down. From firsthand experience, I cannot tell you how dangerous it is to have everything in your head. What's in your head changes based on how much coffee you've consumed, the time of day, if you're getting along with your spouse, or whatever. Get that marketing plan out of your head and put it on paper. Revise as necessary and be willing to be flexible—but get it out of your head and refer to it often.

At a minimum, you need to create at least one press release (and preferably more than one, targeted to a different audience). In most cases, you don't send the same press release to a newsgroup that you send to a publication. You can say the same thing over and over; just take the time to phrase your message so that whoever you want to read it doesn't have to switch gears mentally to "get it." Before you send out the press release, proof it carefully for grammar, spelling, and typographical errors. Once it's gone, it's gone; there's nothing more embarrassing than finding a sixth grade grammar mistake in your professional press release.

An essential part of your plan is your media kit. This includes a copy of the full version of your program. Never, ever, send a potential reviewer a crippled version of your program; send a complementary license code to enable the full version. Always test your media before you send it, to make sure you have the right version, to be sure the media is uncorrupt, and to

ensure the program runs and installs properly. Interacting with the press and media relations is beyond the scope of this article but you can find a wealth of information online and at your local bookstore.

Into action!

At this stage, you have a product and know how to position it. Now's the time to go into action.

If you have a good product that meets or creates a need, and you've followed the steps outlined thus far, you should start seeing registrations about now. At this point, you need to make sure that no customer is lost, or you will likely never see them again. You've worked too hard to get this far and drop the ball.

Spin a globe and randomly stop it with your finger. If someone can't buy your program in that exact spot (assuming they have payment in hand) then you have an issue that needs to be addressed. Please don't make the mistake of thinking that if someone wants to buy your product bad enough they'll send you whatever payment or currency you specify. At a very minimum, you should be able to accept major credit cards, purchase orders, and checks. Think of the customers outside your own country; be willing to accept a form of payment convenient to them. Example: Your program costs \$39.95 and it costs you \$15 to cash a non-USA check. Would you rather have \$24.95 or \$0.00? Access is another piece of the selling puzzle. A customer should be able to call and buy your program during the business hours of whatever time zone you're in, and they should be able to order online 24 hours a day, 7 days a week. Real time online fulfillment is increasingly common and is perfect in some situations, and inappropriate in others. If you're not able to collect orders and payments on a full time basis, get an outside firm to handle your fulfillment. (Full disclosure: Providing this service for shareware authors is a core component of BMT Micro's business).

Support

Even with a good help file, customers have questions or need help. A wise thing to do is to add a section to your help file, name it "Frequently Asked Questions," and offer the solutions to these questions in this section. It saves everyone time.

The type of support you offer should be clearly explained in your documentation and you should live up to your word. If you offer no support to unregistered users, say so up front. Some authors use support as an incentive to get someone to purchase the software.

By definition, support should be handled regularly and often. You should take care to present yourself in a courteous and professional manner. At times, you will deal with a customer you literally wish would just go away. That's pretty rare actually, and you can avoid a lot of problems by conducting your business like the business it is. Put yourself in the customer's position and do the best you can. Very soon, you'll be out in public somewhere dealing with a clerk and you'll think "I'm acting just like that customer did last week..." File these epiphanies away and remember them when you're having a hard time.

I've only hit the highlights of a very broad subject with variables that are unique to each product. Once you start to work you'll find your way and if you get stuck you can get back on track easily enough. I strongly encourage you to find another successful author and try to establish a mentor relationship. As we discussed in the first installment of this article, shareware authors are people first and most often are generous to a fault with their time and talent.

If I can ever help you, please don't hesitate to contact me and I'll share with you the information I have on hand and if I can't help you I'll point you towards someone who can. And remember, never give up. ☺



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Planning a Warp Event for 2000

by Bill Schindler

The Phoenix OS/2 Society plans to sponsor a celebratory event for OS/2 in the spring of 2000. To kick things off, you're invited to a planning session at the March general meeting on Tuesday, March 9.

The purpose of this meeting is to prepare a plan for everything that has to happen between now and then.

What has gone before

Back in September 1998, the POSSI Board of Directors decided that the Society would consider bidding on Warpstock 99. A bid committee was created. The committee worked on several areas, including researching potential sites, discussing the program, and planning out logistics.

In January, after analyzing the options, the committee decided that there wasn't enough time to stage an event of the quality desired. Phoenix OS/2 Society President Dick Krueger posted the following message to the Society's discussion email list:

"The Phoenix OS/2 Society Board of Directors has decided not to post a bid to host Warpstock '99. We arrived at this decision because we don't believe we would have enough time after the awarding of the bid (assuming we won the bid) to adequately prepare to stage an event of the quality we would like.

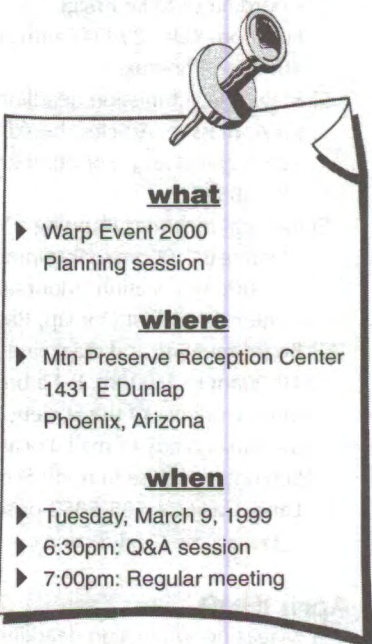
"We're looking into our options for 2000."

Options 2000

Even though POSSI couldn't put on an event in the fall, the Board and the committee decided that we still wanted to put on an event.

The committee decided that the spring would be the best time. Beyond that, there's no specific dates set, the event's agenda is wide open, and format is still open to dis-

cussion. In fact, the event doesn't even have an "official" name yet! The committee has brainstormed a list of possibilities for the event, just to get things started.



what

- ▶ Warp Event 2000 Planning session

where

- ▶ Mtn Preserve Reception Center
1431 E Dunlap
Phoenix, Arizona

when

- ▶ Tuesday, March 9, 1999
- ▶ 6:30pm: Q&A session
- ▶ 7:00pm: Regular meeting

This meeting is your chance to take part in creating an event celebrating OS/2, OS/2 users, and POSSI. Any suggestions and comments—from tame to wild—are welcome!

See you there! ☺



Coming events

A list of events scheduled by the Phoenix OS/2 Society and other OS/2 user groups.

.history

March 1999

- | | March | | | | | | |
|--|-------|----|----|----|----|----|----|
| | S | M | T | W | T | F | S |
| 2 net.sig (Internet SIG). Meeting is 6:00pm to 8:00pm. Coordinator Mike Briggs. Location: KDC, 2999 N 44th St, 4th floor, Phoenix. | | 1 | 2 | 3 | 4 | 5 | 6 |
| 5 Magazine submission deadline for April issue. Articles should be sent to editor@possi.org. For other arrangements, call 602-585-5852. | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 9 General meeting; Planning a Warp Event for 2000. Meeting is 7:00pm to 9:00pm. Q&A session is 6:30pm to 7:00pm. Location: Mountain Preserve Reception Center, 1431 East Dunlap, Phoenix. | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 27 Board meeting and magazine prep. Meeting is 10:00am to 1:00pm. Eat a brunch, learn about the inner workings of the Society, and help get <i>extended attributes</i> ready to mail. Location: Bill and Esther Schindler's house in north Scottsdale, 9355 E Mark Lane. Call 602-585-5852 or send email to esther@bitranch.com for directions. | 21 | 22 | 23 | 24 | 25 | 26 | 27 |

April 1999

- | | April | | | | | | |
|---|-------|----|----|----|----|----|----|
| | S | M | T | W | T | F | S |
| 5 Magazine submission deadline for May issue. Articles should be sent to editor@possi.org. For other arrangements, call 602-585-5852. | | | | | 1 | 2 | 3 |
| 6 net.sig (Internet SIG). Meeting is 6:00pm to 8:00pm. Coordinator Mike Briggs. Location: KDC, 2999 N 44th St, 4th floor, Phoenix. | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 13 General meeting. Meeting is 7:00pm to 9:00pm. Q&A session is 6:30pm to 7:00pm. Location: Mountain Preserve Reception Center, 1431 East Dunlap, Phoenix. | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 24 Board meeting and magazine prep. | 18 | 19 | 20 | 21 | 22 | 23 | 24 |

May 1999

- | | May | | | | | | |
|---|-----|----|----|----|----|----|----|
| | S | M | T | W | T | F | S |
| 4 net.sig (Internet SIG). Meeting is 6:00pm to 8:00pm. Coordinator Mike Briggs. Location: KDC, 2999 N 44th St, 4th floor, Phoenix. | | | | | | | 1 |
| 5 Magazine submission deadline for June issue. Articles should be sent to editor@possi.org. For other arrangements, call 602-585-5852. | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 11 General meeting. Meeting is 7:00pm to 9:00pm. Q&A session is 6:30pm to 7:00pm. Location: Mountain | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | 30 | 31 | | | | | |

Preserve Reception Center, 1431 East Dunlap, Phoenix.

- 22** Board meeting and magazine prep.

June 1999

- | | June | | | | | | |
|--|------|----|----|----|----|----|----|
| | S | M | T | W | T | F | S |
| 1 net.sig (Internet SIG). Meeting is 6:00pm to 8:00pm. Coordinator Mike Briggs. Location: KDC, 2999 N 44th St, 4th floor, Phoenix. | | | | 1 | 2 | 3 | 4 |
| 5 Magazine submission deadline for July issue. Articles should be sent to editor@possi.org. For other arrangements, call 602-585-5852. | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 8 General meeting. Meeting is 7:00pm to 9:00pm. Q&A session is 6:30pm to 7:00pm. Location: Mountain Preserve Reception Center, 1431 East Dunlap, Phoenix. | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 26 Board meeting and magazine prep. | 20 | 21 | 22 | 23 | 24 | 25 | 26 |

July 1999

- | | July | | | | | | |
|---|------|----|----|----|----|----|----|
| | S | M | T | W | T | F | S |
| 6 net.sig (Internet SIG). Meeting is 6:00pm to 8:00pm. Coordinator Mike Briggs. Location: KDC, 2999 N 44th St, 4th floor, Phoenix. | | | | | | 1 | 2 |
| 5 Magazine submission deadline for August issue. Articles should be sent to editor@possi.org. For other arrangements, call 602-585-5852. | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 13 General meeting. Meeting is 7:00pm to 9:00pm. Q&A session is 6:30pm to 7:00pm. Location: Mountain Preserve Reception Center, 1431 East Dunlap, Phoenix. | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 24 Board meeting and magazine prep. | 18 | 19 | 20 | 21 | 22 | 23 | 24 |

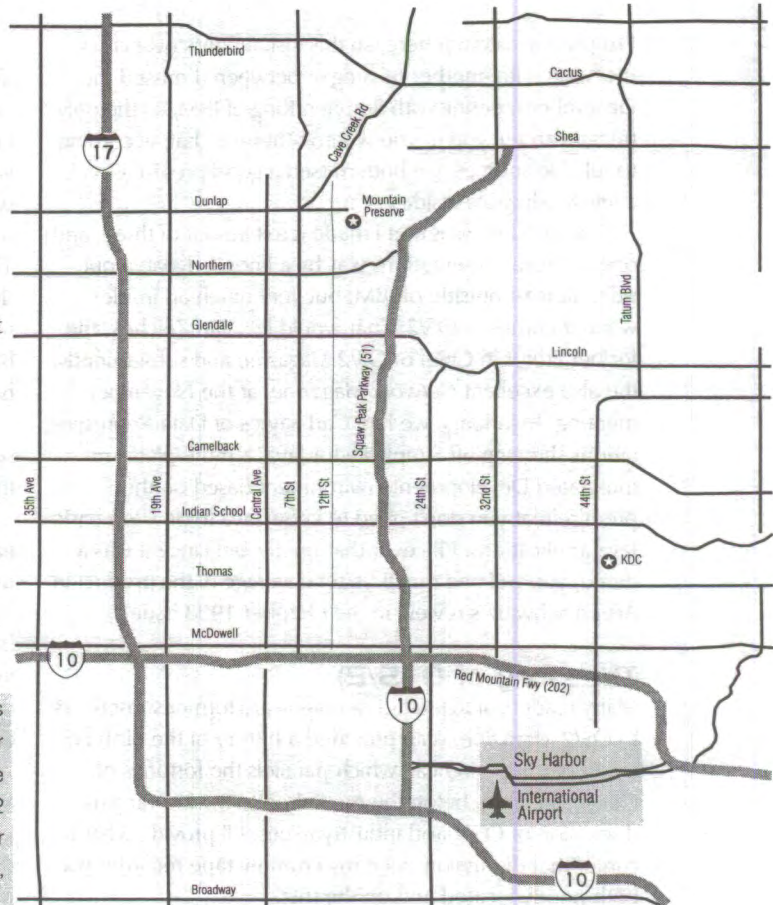
Meeting locations

Directions to meeting locations.

General meetings are held at the Mountain Preserve Reception Center, 1431 East Dunlap, Phoenix.

From the Black Canyon, exit at Dunlap and head east. From the Squaw Peak, exit at Northern. Go west to 12th Street, turn right, go north to Dunlap, turn right, and it's two blocks up on the right.

The "How OS/2 Works General Interest Group" and the Internet SIG (net.sig) meet at Knowledge Development Center, 2999 N 44th St, Suite 400. That's just north of Thomas, in the building with the green dome. Plenty of free parking is available in the garage behind the building. ☺



If the mailing label on the back cover says "sample" then this may be the only copy of *extended attributes* that you will ever receive. If you want to keep getting the magazine (and receive all the other benefits of membership), you must join! A 12 month membership in the USA is only \$30. (See the form for membership pricing in other areas.) Tear out the application, fill it in, and mail it with your membership fee today!

IBM Works (continued from page 5)

attention to margins. Then click on **Save**. Probably, you'll get a message about fields not fitting on the label and being clipped. Say **OK**, and modify the field placement manually.

If these are mailing labels, delete the field names, and leave only the data. A minor annoyance is that the labels, just like the regular forms are not laid out by lines, and varying amount of text in one field cannot control the placement of the next one. So <First> and <Last> names must be fixed in location, and the gap between them will vary depending on the length of <First>. Print a few labels on plain paper stock, using a small selection of the database, to verify the layout, margins, etc.

Wasn't that easy?

Many features of the IBM Works database are harder to use than they should be. Dialogs branch too deep, and the program is somewhat quirky, but there is logic in all of that. Once you dis-

cover its capability and get used to it, I think you will like it.

This article was an attempt to get a new user started, but I'm leaving plenty for you to discover. If you need a simple but efficient database program, load that Warp CD, do a selective install, and try the IBM Works database. ☺

Pavel Otavsky is a mechanical engineer who has spent most of his career designing disk drives and mass memory systems. He works for a small materials research company and does occasional ME consulting. After buying his first PC in 1988 he wrote a utility to automatically correct the slow system clock, and he keeps his customer database on IBM Works. He lives in central Vermont and can be reached by email at otavsky@sover.net.

Pavel thanks Larry Linder for kindly reviewing the draft and offering a number of helpful suggestions.

A meeting two-fer

The audience is wowed while Joel's tape recorder flutters

by Joel Frey

I'm playing catchup here, so this installment covers two meetings with another missing in between. I missed the December meeting with Stephen King of IBM, so the only thing I can tell you (if you weren't there) is that, according to reliable sources, we both missed a good presentation by a knowledgeable insider.

The good news is that I made it to two out of three, and one of those presentations was by a knowledgeable outsider, at least outside of IBM, but very much an insider when it comes to OS/2. That would be Alan Zeichek, the former Editor in Chief of *OS/2 Magazine* and subsequently, the also excellent *Network Magazine*, at the November meeting. In January, we had Carl Sayres of Data Representations showing off Simplicity for Java, a multi-platform Integrated Development Environment based on the premise that you don't need to know Java to develop basic Java applications. I'll cover that briefly, but since it was a demo, you will find much better coverage of the product in Armin Schwarz's review in the October 1998 issue.

The story of O (S/2)

Many readers of *extended attributes* are former subscribers to *OS/2 Magazine*. Alan provided a history of the birth and death of the periodical, which parallels the fortunes of OS/2 in general, before he moved on to a wide-ranging discussion of OS/2 and industry issues. I'll provide what I can of that discussion since my crummy tape recorder was both poorly located and on the fritz.

Alan was working at Miller Freeman Publishing on a magazine named *CADENCE* for the AutoCad market in the 92-93 time frame when OS/2 2.0 came out. It looked like OS/2 was going someplace, and Miller Freeman already had a deal with IBM to publish *OS/2 Developer* for them. Alan and one of his colleagues approached Associate Publisher Kathy Passage about putting out an OS/2 magazine. She was enthusiastic about the idea because IBM had a cooperative advertising arrangement for ISVs.

The first issue came out in December of 93 and was targeted at business. According to Alan, "OS/2 was everywhere at Comdex '93 and we were convinced we had the next *PC Magazine*. It looked like Windows was dead in the water. Chicago was being talked about, but Microsoft was not really the powerhouse they are now." There were two competitors for *OS/2 Magazine*; *OS/2 Monthly* (which "never came out monthly"), and *OS/2 Professional*. He said magazines break even on subscriptions and make their money on advertising; they felt IBM pulling back about the time "Chicago fever" hit.

In January of 96, they quit publishing *OS/2 Developer* and folded it into *OS/2 Magazine*. Alan said he felt it would have been better to shut *Developer* down completely because they were barely able to satisfy that readership with what was left. One problem was that they had a deal with IBM to get the names of everyone that registered OS/2 so they could make a direct mail offer for a subscription. Through "an incredible blunder" on IBM's part, they only delivered 50,000 names in 1996, but IBM had to have sold many more. He said they heard that IBM had boxes and boxes of cards that were never delivered because nobody had responsibility for them.

During a discussion of the prospects for IBM's ongoing support of OS/2 and the possibility that IBM might release the source for OS/2, he made the following comments.

"IBM is the world's largest ISV. Every NT user is a potential IBM application customer. The longer you guys (OS/2 users), at least from IBM's perspective, stick with OS/2, the more competition there is for IBM's other products, because most of them are for Windows. When they improve the Workplace Shell, not only is it costing them more money and effort, it is making you less likely to buy one of their other products.

"I think Linux is a wonderful competitor to NT Server. Microsoft competes with other vendors, [but] there is no Linux Corp., so Linux doesn't compete with other vendors, except those that make an OS. Therefore, I think Linux is a wonderful platform for hardware vendors to rally around. Whether they're going to or not, I don't know, but they're starting to."

Someone in the audience responded, "It seems more the software vendors that are doing that now. It seems to me that IBM has a compelling interest in seeing Linux succeed. My question is, to whom and how would you make the argument to IBM that they should release the source code to SOM and the Workplace Shell so that it can be ported to Linux?"

AZ: "I think that's a wonderful idea. I think the argument you could make to them is that if you included the WPS on a distribution CD with XWindows and Motif, it would provide a wonderful migration path for existing OS/2 users. Even if the OS/2 kernel isn't going to work anymore, what most OS/2 users love about OS/2 is not the kernel, it's the WPS, and the stability of the kernel."

Later, during a discussion of Linux magazines, Alan noted that one of the problems with Linux might be the advertising issue. "Who's going to start a cooperative advertising program for ISVs, who's going to bankroll that?"

During the Q&A, Alan answered several questions, including:

Q: His opinion of the flip-flop by IBM regarding OS/2. Was IBM afraid?

AZ: "I don't think it's fear. IBM was a centralized company. Each business unit was told to go out and make money. A lot of people in the company knew they could make money with OS/2, but if one of the groups was selling a solution and had to sell OS/2 as part of that solution, their job was harder. The PC Company was out fighting for market share. A lot of people were fighting hard for OS/2 within IBM, but a lot of business units had no compelling reason to promote it. By the time Lou Gerstner came on board, the damage had been done."

Q: With all of the anti-Microsoft sentiment now, do you think IBM might seize the opportunity to promote OS/2 again?

AZ: "Not a chance."

In my opinion, that's something most OS/2 supporters have come to realize, but were loathe to admit. A number of scenarios have been proposed as the hope for improved support for this platform, including open source and ISV support of a new client, but the reality is that IBM will continue to do for OS/2 only the minimum required to keep their large customers happy. If there's another OS/2 client on the way, that's good news. If they continue to make the improvements necessary, even via fixpacks, to keep up with the surrounding technologies like hardware and networking, that would keep it viable for several more years. The user interface and the stability of OS/2 are the still the primary appeal for many users (along with better file systems and better use of hardware resources) and if those can be had on another platform with a wider range of applications, like Linux, that might be sufficient motivation for many users to migrate, even the corporate ones, who aren't exactly staying with it in droves anyway. There is still plenty of life left in OS/2 as it is, and from the standpoint of application availability, the situation is improving constantly, especially with the

availability of Java applications. There is the possibility of porting the WPS to Linux and the possibility that some organization might take a shot at building a Win32 API (at some fixed level) for Linux, so that those applications could be more easily ported to it as well. This wouldn't be easy but it's not impossible and, in fact, has been done on a limited scale for OS/2. With theuld be easily ported from those environments, as well as its native applications, Linux could actually become the first generic operating platform. Under those circumstance, any resistance ISV's now have to porting their products due to market viability, could evaporate.

Simplicity for Java

At the January meeting, Carl Sayres of Data Representations, Inc. demo'd Simplicity for Java. Although I'm deferring to Armin's coverage of the product in his review, I would like to include some updates here. There is a beta available that provides support for the Java Swing components. These replace

the Abstract Windowing Toolkit (AWT) which used the platform API calls to implement window functions. It also enables the importation of any Java Beans. Carl is also (one of?) the developers of Simplicity and spoke of the need to understand the language when good performance is a prerequisite. And performance was a prerequisite for Simplicity because it executes the code being developed in a parallel window. Carl said that he had serious doubts about the practicality of this approach when he first started, but it seems to work just fine. He was at quite a disadvantage in showing the product due to the low resolution of the overhead display, but he assured us that it was much better cosmetically than we could see. Since this is a multi-platform product, the license is tied to the original purchaser so that additional charges for each platform do not apply. If you want to see Simplicity first hand, Data Representations offers a downloadable demo at their Web site at www.datarepresentations.com. ☺

THE OS/2 SUPERSITE

<http://www.os2ss.com>

- Over 2 gigabytes of OS/2 shareware and freeware
- Mailing lists such as OS2USER and WarpCast
- Home of several popular OS/2 web sites such as OS/2 e-Zine!, EDM/2, OS/2 Connect, Loren Bandiera's OS/2 News and Rumors Page, and Timur Tabi's New OS/2 User page.
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Club members get special deals on commercial software and \$2.50 off every shareware application they register through BMT Micro. Members also get FTP access to the Supersite archive and space for their personal web page. See <http://www.os2ss.com/club/> for details.

The OpenDoc 2D graphics part

The hidden graphics application in OS/2

by Marilyn Pizzo

There is one more component of OpenDoc that we haven't talked about yet. 2D Graphics allows you to make line drawings, shaded areas, and bar graphs. You can create backgrounds from bitmaps. Graphics with captions can be created when you embed 2D Graphics with the Text Part component. This sounds a little like fun.

There are three different ways to work within the 2D Graphics component: Toolbar, Popup menus, and menu bar.

OpenDoc's graphic toolbox

The Toolbar becomes visible when the 2D Graphics component is active. It gives you the tools needed for a new design. There are seven buttons on the Toolbar—Select, Line, Polyline, Rectangle, Box, Ellipse, and Arc. The Select pointer button is the start and stop tool. You use it to identify objects to be edited or to select a shape that has already been drawn. When you finish using another tool to make a drawing, click on the Select button to change the mouse pointer back to its original function from the drawing mode.

Lines are created with line color, line style, line width, and shadow style as the default set of characteristics. When you place the cursor over the Line button you will notice at the bottom of the window it says "Line: click to set the endpoint." When you click on the Line button the statement changes to "Create a LINE: click to set first point." Left click anywhere within the component. This sets the first endpoint. Drag the mouse pointer to the length of the line you desire. Left click again to set the second endpoint. The new line remains selected until you left click the mouse one more time within the component area. Just when I thought I could never draw a straight line without (or with) a ruler, I'm proven wrong.

A polyline is a set of connected points. The default set of characteristics include line color, line style, line width, fill color, fill style, and shadow style. As you saw from the Line tool, the messages at the bottom of the window let you know what is going on. Left click to start your shape. Drag the mouse pointer until you establish the length of the first side. Left click to set the second point. Repeat the procedure until your shape is completed. Double click to end the drawing. If the first point you create and your endpoint are even, a closed polygon will be created.

The Rectangle tool works in a similar way. Once you left click the Rectangle tool and set the first point, drag the pointer until the desired shape is showing on the 2D Graphics component. Left click to set the second corner. To deselect the rectangle object, click somewhere else within

the component area. The Box tool behaves much the same as the Rectangle tool, but with a solid fill, rounded corners, and a shadow.

The Ellipse is created with the same set of characteristics as the other shapes. Unlike the other tools we've looked at so far, when you click on the Ellipse tool you will be prompted to set the center point. Then you drag the mouse to form your ellipse and click the mouse to set the endpoint. When you initially create your ellipse the horizontal axis and vertical axis are default. You can change that later.

The last tool in the Toolbar is the Arc tool. Once you click on the Arc tool you will be prompted to set the center point. Then drag the mouse outward until you have reached the desired width of your arc. Left click to set the first end point. Drag the pointer to create the arc. Left click to end the drawing action.

Menu options

The menu bar has the standard OpenDoc options available. The View and Selected menu items have some choices specific to 2D Graphics. They're fairly self-explanatory, but the Selected menu has some items that are a little different. If you have multiple objects within a 2D Graphics component, you can create the effect of depth using the Layering option. Choosing Move To Front or Move To Back places a selected object on top or behind all the objects in the window. You can group together the Graphics component objects by choosing Form Group from the Grouping option. Editing must be done on the group as if it was one object. Choosing Dissolve Group will undo the grouping. The Freeze option makes a selected object unavailable for editing or moving within the 2D Graphics component. Choose Un-Freeze to make the object available for editing again. While an item is Frozen, other objects can still be edited or moved. To determine how an object's background will be refreshed within the system, select Embed backgrounds. The Opaque option allows the background to be shown on the screen every time the part is opened. The Transparent option causes the background to be invisible.

There are two 2D Graphics component Popup menus: if you right click on the active 2D Graphics component background and if you right click on a selected object. If you right click on a selected object you will have five options: Delete, Rotate, Line, Fill, and Shadow. Rotate turns a selected object on a 360 degree axis or within the component. The Line option allows you to choose Line Color, Line Style, and Line Width within a graphics element. The Fill option lets you color or shade a graphics ele-

ment. The Shadow option gives the graphics object a pattern.

If you right click on a 2D Graphics component background the Popup menu appears. Some of the options are very familiar: Open As, Properties, Show As, and Help. The Background Color option allows you to change the color of the area within the 2D Graphics component. The Hide toolbar option allows you to make invisible the Toolbar. Once you choose to hide the toolbar, this option changes to Show toolbar.

Let's put it together

There are four steps in creating a new OpenDoc document. They are choosing a root container component; choosing components to embed into the root component; dragging templates to the Desktop; and Embedding components into the root.

If you remember, the OpenDoc for OS/2 folder is hidden under Programs on the Desktop. Open the Utilities folder. Now open the OpenDoc Templates folder. Drag one of the component template icons to the Desktop. This is a copy of the component itself. You have just created a Root Component. Double click on this object to open it into a document. We learned earlier that embedding is the process by which a component becomes resident in a document.

Once you have embedded the component, you can edit it and move it around within the document. To embed a component, open the OpenDoc Templates folder, drag a template object to your document, and release the mouse button to drop the template into your document.

Once you create your root component document you might want to change the name to something more meaningful. To do this: press and hold the Alt key while you left click on the icon text, release the Alt key, edit the icon text, click on an empty spot on the Desktop, and you're done.

OpenDoc behaves much the same as working with a document within OS/2. It has the usual Document, Edit, View, and

Help menu bar options. Some menu bar choices change depending on what component is active. The OpenDoc Document menu bar looks very similar to that of any document. Open As allows you to display information on the current document in Icon, Tree, or Details view. Document properties opens the Properties notebook for the root component of your document.

If you select the Drafts option from the Document menu you can edit or create a draft of your document. Create draft lets you name a new draft. The Edit menu has an Undo feature that allows you to reverse errors or unwanted changes and return to the original version of the document. You can reverse multiple actions by selecting Undo several times. Redo will reverse the Undo action and is only available as an option if you have used Undo first. The Delete Selection option allows you to delete an entire selected embedded component or selected data within a component. Open Selection allows you to open a selected embedded component into a window-sized view on top of your current document. The menu bar will be for that particular component. Selection Properties opens the Properties notebook for the selected component within the document. If more than one embedded component is selected, a properties notebook for each will open. The View menu has one option that is a little different, Show Links, which highlights any data in an active component that is a link source or link target.

What's a link?

A *link* is a relationship between multiple versions of the same component so that a change to a *link source* is also made to the *link target*. One Link Source can have more than one Link Target but the reverse is not true. A single Link Target cannot have more than one Link Source. You can update changes automatically or manually.

Linking is like copying or cutting and pasting. First, you choose the component or embed you want to link. This is the Link

Source. Then you paste it into a component or document. This is the Link Target. If you make a change to the Link Source, it will be reflected in the Link Target as well. You can break the links also. By selecting Break Links from the Edit menu of the Link Source, all links originating at the selected source will be broken. Break Links from the Edit menu of the Link Target breaks the link between the selected target and its source.

OpenDoc has some fairly powerful stuff for being so well hidden.

Next month I will give some actual experiences with creating documents, embedding components, linking, and everything else available. Since the Mac OS also supports OpenDoc, it would be interesting to see if something created in OS/2 is recognized on a Mac and vice versa. ☺

A week in the life of a developer

Nobody disturbs programmers, right? In your dreams!

by John Wubbel

I have a private office. You can not just walk in. My office has badge access only, because what I am developing is so important that your trivial interruptions will cause me to miss my delivery date. And oh yes, I do not talk to customers. Take your problem down the hall.

Yeah right—only in your most utopic introverted world.

Realistically, developers tend to own a product or the component pieces of code that make up a product. As developers, we often measure our personal daily worth or productivity in the number of lines of code we wrote in a week. We get satisfaction from looking at new code and seeing new functions execute. New development is always a welcome opportunity and it's certainly more desirable than maintaining existing code or supporting it in the field.

But, how many times during the week does a developer get dragged away from his real job description to work on solving other problems? The answer seems to be "more often than we like."

Getting 'em connected

Working and developing on the OS/2 platform is no different than others. Perhaps it's more difficult in certain areas, because OS/2 does not currently enjoy the same wide spread usage as MS Windows.

For example, consider the question of connectivity for new customers. We wanted our widely dispersed customers to have an Internet Service Provider. If we configured their system, it was a pain to locate local providers. For many providers, Warp is not a word in their vocabulary. With a little research, we found that AT&T supports other operating systems including OS/2 users. It is just slightly more tricky to configure.

Normally AT&T sends out a CD-ROM to get Windows or Mac users registered. Everyone else has to visit a Web site, called the WorldNet User's Reference Desk, at www.wurd.com. This Web site has good support for people using other operating system platforms such as OS/2, BeOS, and Linux.

The first thing to do is investigate the registration process at www.wurd.com/wurd/register/index.htm. AT&T has a dedicated "Registration Server" that you can dial up. This is actually a Web server only for transacting a registration. It takes your information and supplies you with a user ID and password.

Installing OS/2 on new hardware is also a challenge. People call upon the developer, because it is believed that somehow he or she has more knowledge about the system. The most common problems have to do with driver support for new chip sets such as video, PC Cards, or sound.

The effort to locate the resource for a driver is more time consuming than the actual installation. Once you get the system installed, you are satisfied with the latest FixPak, and the general health and performance of the machine.

Remotely worried

You no sooner get back to the office than someone else is calling you up to describe another problem. "Something is running on my system and I don't know what it is! I want it off!" Oh great. The first thing you think of is a virus.

When you get on the scene, you find out what the end user is talking about. Sure enough, there is something running. You do not know what it is or where it came from. (Meanwhile, you should be back in your office checking in code to version control for the build this evening. Instead, the afternoon is nearly shot investigating the mystery.)

It turns out the mystery is Remote Services Management. No one remembers specifically installing this or how it ended up in CONFIG.SYS. You cannot quickly find any documentation on the system. When you accidentally grep the system, you find out that it has something to do with the Bonus Pack. One thing leads to another and you find a subdirectory containing the device drivers and one lonely INF file. The INF file yields more information regarding the function, what company produced the software, and even a folder with icons. Lo and behold, you dig deep—sure enough some clown *did* install it. Plus, it takes some resources to keep around. It is like Art the Elephant, you want it off of the system for good. Or, do you?

This software was known as PolyPM/2 and was produced by International Software Solutions (ISS) for IBM. It enables IBM service to dial into your computer to assist in servicing problems. But how many end users ever had an authorized IBM person dial into your machine and take control of it to resolve a problem? Not very many people, I will bet. I have dialed up many systems over the years where the kernel debugger was installed, but never using the PolyPM/2 product. So, I started thinking... maybe this would be useful. If I could dial up a person's machine, I would not have to leave my office. Am I brilliant or what?

A Web search reveals that ISS was bought up by Peregrine Systems out of San Diego. The PolyPM/2 product was renamed to Remote Services Management (RSM). And, it was wonderful to find out the company still provides support for OS/2. It says RSM can be used for Help Desk, remote support, teaching applications, troubleshooting of applications and/or for network management, including server maintenance and automated data distribution/collection application.

In the process of solving a mystery, I learned something, and a new resource for supporting OS/2 was uncovered. So, the day is not a total loss.

Troubleshooting Netscape

About half way through the week, another trouble ticket falls on your desk. It turns out to be the infamous "The Light Went Out in the Lighthouse." Translated, this means Netscape Communicator is having problems and somebody thinks you can fix it.

This is almost the straw that breaks the camel's back. You are fit to be tied and it is a darn good thing your door has that electronic lock until the steam pressure subsides and your temper cools off. It is those repeat offenders that are the hardest to take.

About this time, people are looking at you funny, because you are mumbling strange things to yourself as you walk down the hall. Like, how can a company have the nerve to release such a defective software product? The bigger the application, the harder they fall. You have heard every conceivable problem about Netscape Communicator from the Messenger Mailbox to the Page Composer trapping. End users have reported hangs and slowness in exiting. Why in the world can't someone write a decent Web browser?

The most irritating thing is that, as a developer, you realize the underlying reasons these failures occur. But you are strapped to get any kind of fix. For instance, Netscape can appear to be running, but takes control away from you because the processor is max'ing out; the developers did not know enough about thread priority or semaphores. Usually, if Netscape is blocked on a semaphore, you get no response from the system. If Ctrl+Esc is used to bring up the Window List and it draws really slow, then Netscape is giving a very tiny time slice, but not enough to do anything else with the system. Programs that use communications (i.e. those using a port) have been well written and understood by developers for a long time now. The Internet connec-

tion might still be good, but nothing is coming down the pipe. Such an event makes you think that a time out would occur and priority management take place. You really can not blame it on OS/2, because you have seen or heard about similar Netscape problems on Windows NT systems.

The sad fact of the matter is that Netscape did not thoroughly test this software; or, if they did, they shipped it with known defects. And IBM consented to distributing a defective product to the OS/2 community. This does consumers a great disservice. Expecting consumers to report defects for something as fundamental as a Web browser application is ridiculous. I realize also that other agendas drove the schedule to get the Navigator Communicator out the door, such as the fact that IBM DB2 documentation is now highly dependent on a Web browser. Just maybe, consumers would be better served if companies would remove all the add-ons and spend more time getting the base product to function without fault.

So now that you are over your PMC tantrum, how do we solve the end users problem? Fortunately, there is a very effective way to resolve many situations. I call it the SOHO Power Platform Solution. You can put together a better system than most other OS/2 or Windows users have. First, start by taking an application such as Netscape Communicator, and list its functional parts. Then, go out and research resources that can take the place of those integrated components. For example, the Messenger Mailbox can easily be replaced by one of the very affordable OS/2 email clients. The Page Composer can be replaced by a standalone Web publishing application. Users having trouble reading news groups can adopt NewsReader/2 or a third party shareware program. NewsReader/2 is already available; like a lot of other things, users simply are not aware that it is already in a folder waiting to be started.

Among the distinct advantages of this solution is that these SOHO type programs

run very efficiently, without fault. This drastically increases user productivity. The developer can spend more time designing and writing code and less time answering help desk type calls. It is a little like putting a computer on a diet.

And maybe in the future, we can hope someone writes a blazing fast browser program to cruise the Web, and avoid "crashing the Lighthouse."

Over all, building programs, designing a desktop or simply a folder full of specific applications for a particular customer requires resourcefulness, innovation, and sometimes inventiveness. Usually, disagreements over the OS happen at times because we simply do not understand how each of us use a system. I have a dear friend running Windows 98. He gets extremely jealous because I personally do not use Windows software. After repeated attempts to get me to change my ways, he has tried OS/2 and liked it very much. With this good experience, he may even be willing to try Linux. However, he still does not understand my use of OS/2 to solve problems or facilitate accomplishing my job description.

Tomorrow's another day

As a developer, you get to see many users, how they work and what they work on. So developers, many times, have a better appreciation for the various OS environments, even though there are times where developers have to change hats and solve other peoples problems. ☺

New and improved

.random bits

compiled by Esther Schindler

As you've probably noticed, a growing number of the new OS/2 releases are freeware, or very inexpensive shareware. I suppose we could draw either positive or negative conclusions from that observation. This month, however, features updates from a couple of larger software vendors. Is the pendulum swinging?

If any of these products interest you, keep in mind that you can check them out for free and assist other members of the Society. Contact Craig, at reviews@possi.org, to find out what's involved in writing a product review for *extended attributes*.

PmAs

PmAs 1.0 is a set of free astronomically oriented programs. PmAs calculates the positions of celestial bodies and rising/setting times, and displays the results in table and/or graphic form. It's all nicely integrated in a GUI interface.

You probably need a minimal background knowledge of astronomical terms and concepts to make use of the whole package. Contact the author, Cornelis Bockemuhl, at cbockem@datacomm.ch or visit www.datacomm.ch/cobo.

HOUSE/2 updated

House/2 1.7 is an OS/2 Warp program to control the home automation interface model CM11x/CM12x (ActiveHome kit) made by X-10.

X-10 components let you easily automate lights and appliances without extra wiring. Plug the modules into the outlets, and program them when to turn on, right from your OS/2 based computer. It's a fun and inexpensive home improvement project.

Version 1.7 provides twelve or eighteen selectable module groups, allowing you to control up to 288 modules from one configuration. You can create voice macros with slider hotkey assignments, and use the log decoder to interpret log entries.

House/2 is \$35, and is available at BMT Micro or <http://home.att.net/~ASchw>.

CheckUrl

CheckUrl 1.0 reads a list of URLs from a text file, and determines if the pages exist. It's useful for Web site administrators to check dead URLs. This REXX program works with HTTP and FTP. It requires Rxsock and Rxftp DLLs.

Download CheckUrl from <http://village.flashnet.it/~rm03703/programs> or from Hobbes.

DH-Grep-PM I.05

Grep stands for "Get Regular Expression and Print." First

developed for Unix systems, grep is a text searching tool that has been ported to most operating systems.

Grep's often cryptic command line options have been replaced with easy to use menu selections. DH-Grep-PM runs in a low priority mode, reducing the impact the search has on other active programs.

This release adds an option to prompt for search parameters when the program starts, saves color and font changes from session to session, and improved the online help functions. It's \$10, and available at BMT Micro or www2.southwind.net/~dwhawk.

GL-Cube

GL-Cube is a Rubik's cube type game. You try to solve the cube in the shortest possible amount of time. There's billions of wrong combinations, but only one correct one!

You can play GL-Cube by yourself, against another person, or tell the computer to solve automatically. Using almost every OpenGL feature, GL-Cube provides a great way to show off your computer's 3D capabilities. With the computer auto-play feature and a full-screen mode, it also makes a great screensaver!

This version has an improved appearance, background image support, and sound effects. It's \$10. GL-Cube is available at BMT Micro or from <http://webhome.idirect.com/~aquilat>.

CCA

The Command line Clipboard Access (CCA 1.1) programs allow you to access the OS/2 clipboard from the command line in a full screen or windowed OS/2 session.

In CCA 1.1, PMClip2.exe and Fclip2.exe functionality are combined into one program.

The unregistered shareware version is fully functional, but adds an identification line to the clipboard text. This \$12 application is available at www2.southwind.net/~dwhawk, at BMT Micro, or from Hobbes. Contact Don Hawkinson (dwhawk@southwind.net).

PowerAlert

Tripp Lite PowerAlert 10.1 has a new customizable installation, which allows IS managers and other users to create repeatable installation configurations for enterprise-wide UPS systems. Rather than install and configure 100 units to the same specifications, a PowerAlert version 10.1 user has the ability to create a custom installation that will auto-configure all the delay times, COM ports and actions of their UPS systems.

PowerAlert version 10.1 builds on previous versions' success as the leading universal network UPS management software. PowerAlert Software provides universal application shutdown, actively saving data files first before shutting down the operating system. Most other manufacturers' UPS



software only shut down the operating system, resulting in lost data and consequently time and money. PowerAlert Software controls virtually all legacy systems from any manufacturer, upgrading their usability and performance. In addition, PowerAlert software provides outstanding monitoring of network power conditions allowing users to proactively address power concerns. PowerAlert is fully Year 2000 Compliant.

The customizable installation feature is only available for Windows NT at this time. Tripplite tells us that it's planned to be avail-

able for OS/2 in the future. Yet we're told that, when you get to the download page, the OS/2 version is listed and available. Find it at www.triplite.com/software/update.html.

The Wall

Pretty Pop Software released The Wall 3.25. The Wall changes background images and/or colors at user-set intervals. You can configure image files in BMP, GIF, JPG, TIF, TGA, PCX, DIB, and choose tile, sized, or normal display. The Wall writes an extended attribute for each one, and displays the .BMP as configured.

You can get a copy from <http://member.nifty.ne.jp/pretypop>, www.asahi-net.or.jp/~qw6k-knst, or www.asahi-net.or.jp/~qw6k-knst/software. Or contact Ken Kinoshita (kinop@sakura.email.ne.jp).

This OS/2 application requires Watcom's VX-REXX runtime module (VROBJ.DLL).

Sokoban for OS/2

Sokoban is an addictive puzzle. Sokoban (Japanese for "warehouse man") moves boxes in a maze into their storage areas, ideally in the least number of moves and pushes. There are 350 mazes of varying levels of difficulty to solve!

Sokoban for OS/2 1.01 is freeware. Obtain it at www.xylo.freemove.co.uk/sokoban.htm, or contact Tse Shum Fat (tse@xylo.freemove.co.uk).

CAD/Off

CAD/Off 1.0 disables the Ctrl+Alt+Del keys for rebooting and enables them again after system shutdown allowing you to reboot the system then. CAD/Off is freeware.

Find more information at www.informatik.uni-trier.de/CIP/thielen/cadoff or contact the author at Thorsten Thielen (thth@gmx.net).

DragText updated

DragText v3.0 for OS/2 Warp lets you handle text as an object. You can transfer text between windows, files, and the clipboard using drag and drop, drag text within or between windows, or drop it on a folder to create a file. Drop a file in a window, and DragText will insert its name or its contents. When DragText's optional WPS classes are installed, you can also drag text to and from the clipboard. Add new text to a DragText file simply by dropping it on the file's icon.

With Version 3.0, DragText expands its scope to provide direct access to WPS objects from within your application programs. Use a filename or object ID found in text as a link to the object it names; use a window's system menu button as a link to the WPS object that opened it. Drag these "virtual shadows," open them, or show their menus, without ever opening a folder!

To complement these new abilities, DragText v3.0 adds DTPProgram, a feature-laden extension of the Program Object

An Email Server for You

Inet.Mail for OS/2

The only email server for OS/2 with a Presentation Manager interface. Easy to understand set-up, mailing lists, spam control, and more. Take Inet.Mail for a test drive by visiting us at <http://www.hethmon.com>.

Hethmon Brothers Software - Internet Server Software for OS/2
www.hethmon.com -- sales@hethmon.com



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class, and DTSnip, the easiest way to collect and cache text.

DragText works with many popular programs such as editors and email clients. Its basic features (drag-and-drop text and DTProgram) are yours free for unlimited use. You can try the extended features (file, clipboard, and WPS support) for six weeks before registration is necessary.

DragText is \$20, and available at BMT Micro or www.usacomputers.net/personal/r1walsh.

RoboJob 2.35

RoboJob 2.35 is a set of integrated powerful Job Scheduler utilities, which works locally or across a LAN. Version 2.35 updates the application for Y2K compliance. It's \$49 at BMT Micro.

InJoy Firewall 1.1

F/X Communications' InJoy Firewall acts as a gateway for computers on your network. The product is designed for LAN-to-LAN configurations, including the new cable modem and xDSL installations.

Like other F/X products, the InJoy Firewall is millennium proof, scalar, and fast. It has been carefully designed to provide the robustness needed by consumers, small businesses and large enterprises.

Version 1.1 is a graphics application, links monitoring with statistics and alerting, and provides support for filter and firewall plugins. It has identd support and priority settings.

More information is available at www.fx.dk/firewall.

RacerNet

Frugal Software Inc.'s RacerNet 1.0 for OS/2 accelerates Internet connections by managing the Hosts file. The more host names in your Hosts file, the fewer requests your computer has to make to your Domain Name Server, freeing up bandwidth.

RacerNet lets you add, remove, change, verify, and import host names. You can mirror a Hosts file to other directories, to centrally manage Hosts files used by multiple operating systems.

Import from Netscape Navigator, IBM Web Explorer, Microsoft Internet Explorer, VxFTP, EmTec FTP, Connexion Collection, FTP Browser, NetLookout, Opera, Power-

Marks, Web Navigator, and plain HTML files.

RacerNet is \$10, available at BMT Micro. See www.frugalsoft.com/racernet for more information.

PopCD!

PopCD! 2.01 is a popup CD-ROM/Removable media/Audio CD Object' Utility. When you insert the CD-ROM/Removable media/Audio CD, PopCD! creates its object on desktop and open/play. PopCD! ejects the CD-ROM/Removable Media/Audio CD when you drag and drop the object into shredder.

This OS/2 application requires Watcom Vx-REXX runtime module (VROBJ.DLL) and EMX runtime modules.

Registration is \$5. It's available at BMT Micro, or at www.asahi-net.or.jp/~qw6k-knst/software.

Norton AntiVirus for OS/2

Symantec Corporation, the world leader in utility software for business and personal computing, announced the release of Norton AntiVirus for OS/2, the only anti-virus solution for OS/2 recommended and marketed by IBM. Norton AntiVirus for OS/2 is currently available on the Norton AntiVirus Solution CD 3.03.

While very few viruses are written specifically for OS/2, customers need to be aware of the potential threat of passing files from an OS/2 environment to Windows or across other environments without scanning first for viruses. It is possible that these files could contain a virus which might cause harm on another platform. However, with Norton AntiVirus, this threat can be eliminated.

Norton AntiVirus for OS/2 includes Symantec's revolutionary heuristic technology called Bloodhound, which provides the best protection available against new and unknown viruses. Bloodhound stops viral files before they can enter a system and cause harm. Symantec's AutoProtect feature, included in Norton AntiVirus for OS/2, monitors a system in the background using real-time scanning in DOS and Win-OS/2 sessions from OS/2, thereby minimizing interruptions and increasing user productivity.

Norton AntiVirus for OS/2 also features LiveUpdate, which looks for virus definition

updates at system boot from a central location on the server and automatically downloads and installs the latest definitions onto the user's system. Norton AntiVirus for OS/2 also includes NAVEX, Symantec's exclusive modular engine technology. It allows the Symantec AntiVirus Research Center to provide the most advanced, up-to-date anti-virus solutions to all customers across all platforms.

Using NAVEX, Norton AntiVirus customers have received instant protection for Office 97 viruses, Java viruses, Trojan Horses, 32-bit viruses and more without a single product reinstallation, lowering the overall cost of ownership. LiveUpdate delivers these engine updates, but NAVEX is what keeps these changes small enough to download over the Internet. With LiveUpdate and NAVEX, users are assured that they are always protected against the latest virus threats.

Norton AntiVirus for OS/2 v5.0 detects and removes IBM AntiVirus for OS/2 during installation, streamlining the migration process for IBM customers.

In addition, because Norton AntiVirus for OS/2 utilizes the familiar OS/2 interface, customers will find Norton AntiVirus for OS/2 easy to use. Norton AntiVirus for OS/2 allows corporate administrators to silently deploy Norton AntiVirus over the network via login scripts. Administrators can use a command-line scanner to scan end-user systems on demand without end-user intervention, thereby giving administrators greater control of their OS/2 installation. In addition, administrators can create an internal LiveUpdate site on a server for central updating of end-user virus definitions.

Norton AntiVirus for OS/2 is available now via site license on Symantec's Norton AntiVirus Solutions CD 3.03. The product also is available through IBM's Passport Advantage program. Updates for the OS/2 platform will continue to be provided by Symantec.

Information about Symantec and its products can be obtained at www.symantec.com. ☺

Understanding the Journaled File System

Look under the hood at JFS' architecture

by David Both

This article is from my "DataBook for OS/2 Warp," available at www.millennium-technology.com. References to other documents are documents in the DataBook; feel free to stop by for more information.

The Journaled File System

Warp Server for e-business provides OS/2 users with a Journaled File System (JFS), for the first time. The JFS uses database journaling techniques to enable quick recovery and restart from system failures.

JFS in Warp Server for e-business uses technology developed for the JFS implementation in AIX, IBM's version of Unix. It extends the AIX implementation with support for extended attributes, Unicode names, and case sensitive searches. Other features include extent-based allocation like that in HPFS, and dynamic space allocation for file system objects.

JFS has significant advantages over other file systems:

- Larger partition sizes. The maximum size has been increased from 64 GB to 2 TB (yes, Terabytes).
- Larger file sizes. The maximum file size has been increased from 2 GB to 2 TB.
- Functional compatibility with HPFS features, such as long file names and extended attributes.
- Improved recovery time. CHKDSK should take no more than two minutes, no matter how large the volume.
- Improved system scalability. New hard drives can be added to a logical volume on the fly without a reboot.

JFS is not a bootable file system, so the bootable partition must be HPFS or FAT. Because Java is required for the LVM GUI, HPFS must be used on the boot partition. (Java uses long file names, which are not supported by the FAT file system.)

There is no technical reason for the JFS to be non-bootable. IBM simply did not have the time or money to include it. It would have required rewriting of the micro-file system and mini-file system used during the boot process. In effect, those two file systems would then be neither micro nor mini.

JFS is only supported on fixed disk drives. There is no advantage to using JFS on a diskette drive, because diskette drives have slow data transfer rates and small data capacities.

The JFS is an installable file system. An installable file system is one which is not an intrinsic part of the operating system but which is installed only when required. JFS is installed with an IFS statement in the CONFIG.SYS file.

Logical Volume Manager

The Logical Volume Manager (LVM) performs functions like those previously performed by FDISK, and manages JFS volumes. LVM supports dynamic partition resizing, dynamic drive lettering, and sticky drive letters. JFS cannot be used without LVM.

Warning: FDISK should never be used on any system using the Logical Volume Manager. Damage to the partitions and volumes will occur and data will be destroyed.

JFS has a powerful disk cache with advanced caching algorithms to improve disk performance. It also uses sophisticated disk allocation strategies to ensure high performance as well as a high level of fault tolerance.

The primary objective of the JFS file allocation strategy is to ensure that files remain contiguous. If a file must be fragmented, JFS attempts to locate the separate file extents as close together as physically possible on the disk. This minimizes head seek time and rotational latency delays, which together for most of the bottlenecks to data throughput on hard disk drives.

JFS performs better than FAT and HPFS in part because it runs at ring level 0, kernel level. This prevents many ring level changes from ring 3 (where HPFS and FAT file systems run) to ring 0 and back. The overhead involved in those ring level changes slows those file systems considerably. HPFS386 does run at ring level 0, which is one of the reasons it is more efficient than standard HPFS.

JFS disk structure

The BootBlock, the SuperBlock, and the SpareBlock contain the basic information required to support the JFS disk structure. This structure is similar to that of HPFS. A block map maps the location of used and unused blocks. The block map is usually located at the beginning of the volume, but can be non-contiguous if the disk volume has been expanded. The rest of the disk volume is allotted to user data storage.

The cluster size for a 1024 MB (1 GB) hard drive formatted for FAT is 16 KB. The average wasted space per file on this drive is 8 KB, or 8,192 bytes. Larger cluster sizes for larger drives waste correspondingly more space per file.

The JFS file system uses a variable block size that can be from 512 Bytes (one sector) to 4096 Bytes (eight sectors). The average wasted space for each JFS file is one half the number of bytes in a block. For small block sizes, this can be a very large savings. For example a one sector block of 512 bytes results in an average wasted space of 256 bytes per file. This variable block size allows administrators to balance the space savings of smaller block size with opera-

tional overhead required to manage larger numbers of smaller blocks. The block size is a `FORMAT` command parameter. The default is 4096 Bytes.

A FAT disk's directory structure has a linear structure, is unsorted, and must be searched from beginning to end. In contrast, the JFS directory is stored in alphabetically sorted order within a balanced tree structure. When you search for a file in a JFS directory, the operating system performs fewer disk reads to find its directory information. This B+ Tree structure is the same as in the HPFS file system.

Each directory entry contains the following information:

- Archive flag
- Hidden flag
- System flag
- Read-only flag
- Pointer to the file's Inode
- Date and time the file was created
- Date and time of last access
- Date and time of last modification
- Length of extended attributes (EAs)
- Number of times the file has been used
- Length of the file name
- File name (1—255 characters)
- B tree pointer

The Inode

Inodes are structures used on JFS drives which contain the allocation information about each file. Inodes are one 512 byte block in size and, wherever possible, are stored on the disk contiguously with the beginning of the file to which they belong. Each file and directory on an JFS formatted drive has an Inode. The data stored in the Inode includes the extended attributes (if they are small enough to fit) and the truncated (8.3) name of the file. If the EAs are too large to fit in the Inode, the Inode contains a pointer to the EAs. Inodes in JFS are the same as Fnodes in the HPFS file system.

The allocation structure contained in the Inode is quite simple because of the JFS strategy of minimizing file fragmentation. A completely contiguous file has an allocation structure which consists of two 32 bit numbers. The first number pointers to the location of the first disk block belonging to the file. The second number is the number of contiguous blocks allocated to the file. This is called the file's *extent*. If the file is frag-

mented, additional extents are added with additional pairs of 32 bit numbers.

Up to 8 extents can be contained in the allocation space of the Inode. If a file contains more than 8 extents, the Inode allocation space contains a pointer to an allocation block. The allocation block can contain pointers for up to 40 extents or, in the manner of the directory B Tree, pointers to other allocation blocks. In this manner a two level allocation B Tree can contain up to 480 sector runs with a maximum theoretical size of 7.68 GB.

Reduced file fragmentation

To reduce the time required for track to track head seeks, JFS stores data in a single extent wherever possible. If new data is added to a file, JFS reserves at least 4 KB of space contiguous with the end of the last existing extent, if possible. If less than 4 KB is actually added to the file, the excess is deallocated when the file is closed.

The JFS file system strategically places files on the disk with room to grow between them. This enhances the probability that each file will later have sufficient space to grow contiguously. In the event that the data cannot be added to the file in contiguous blocks, JFS allocates a contiguous extent as close to the original data as possible, again in order to reduce head seek time and rotational latency.

Even when some fragmentation exists, it may not be severe enough to warrant any overt action to defragment. For instance, a file with two or three extents under JFS would not cause a significant throughput degradation since the file storage strategy keeps the data extents close together. A file with three extents has only two discontinuities, therefore only two minimal head seeks to interrupt the flow of data. (See also "Disk Drive Performance Tuning.")

Sparse file allocation

The JFS also provides a feature called *sparse file allocation*. It's similar to sparse memory allocation used by OS/2's memory management. In the case of file allocation, sparse allocation means that an application can allocate 20 GB for a file. If only 5 MB of data is actually stored in the file, then only 5 MB of actual disk space is used. This saves a great deal of actual disk space from being allocated to empty files. The space is physi-

cally allocated to the disk when it is needed to store data. (See the document, "OS/2 Memory Management" for additional information about sparse memory allocation.)

Journaling

Journaling is the feature that gives JFS its name. JFS excels over the FAT and even the HPFS file systems in its ability to maintain the integrity of your data. The JFS was designed to provide the highest level of structural consistency for the file and directory structures on the volume.

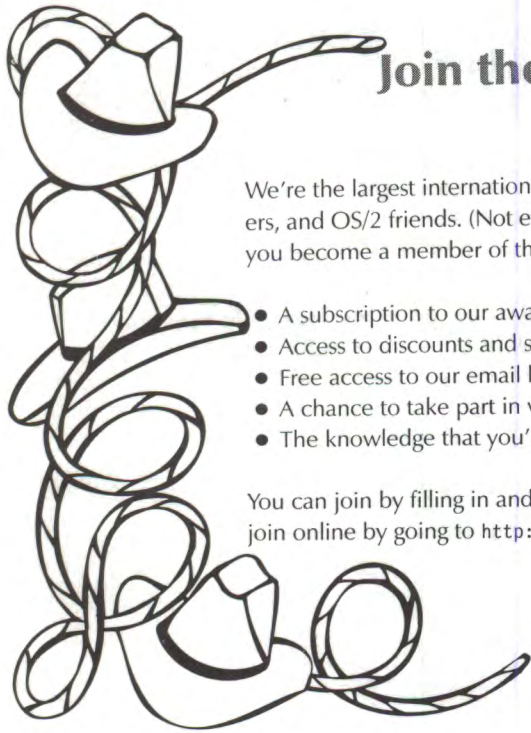
File systems can become corrupt due to a system failure (like a power failure or a hardware defect). Corruption occurs when a logical file operation is only partially complete at the time of the failure. The same type of corruption can occur when the system isn't shut down properly, since file operations may not be complete when the system is turned off.

Older file systems, such as FAT and even HPFS, rely upon `CHKDSK` to examine the structure of the file system to detect and repair problems. This time consuming process is not free from errors and can result in lost or unrecoverable data. Even as good as `CHKDSK` recovery can be on HPFS, it is still not totally reliable.

JFS uses techniques that were originally developed for databases like DB2 to log information about operations performed on the file system. In the event of a system failure, the file system is repaired by replaying the log and applying the appropriate transactions.

This is where the journaling advantages become apparent. When recovering from a problem, JFS' `CHKDSK` does not need to search the entire disk. It looks at the journal, or log, and replays any entries that are contained there. This recreates any file structure commands that had not been committed to the disk prior to the problem.

The journaling approach to recovery significantly reduces the recovery time required and is less error prone. `CHKDSK` on a JFS volume can run in mere seconds as opposed to minutes or even hours on large HPFS volumes. ☺



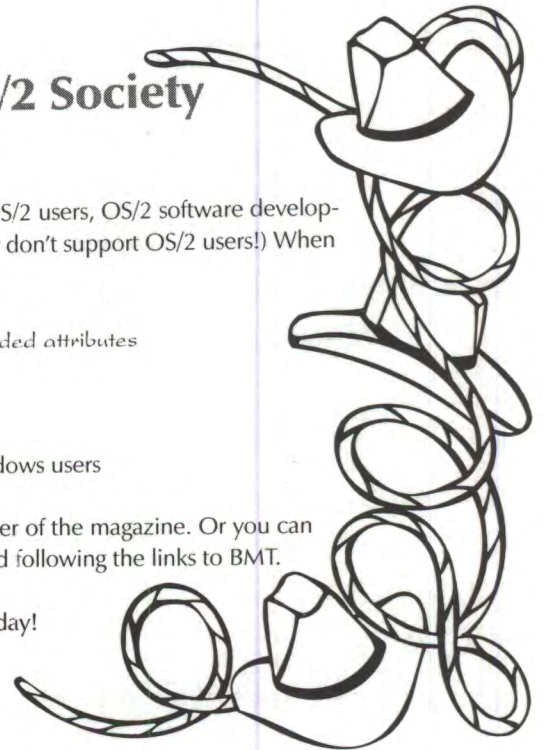
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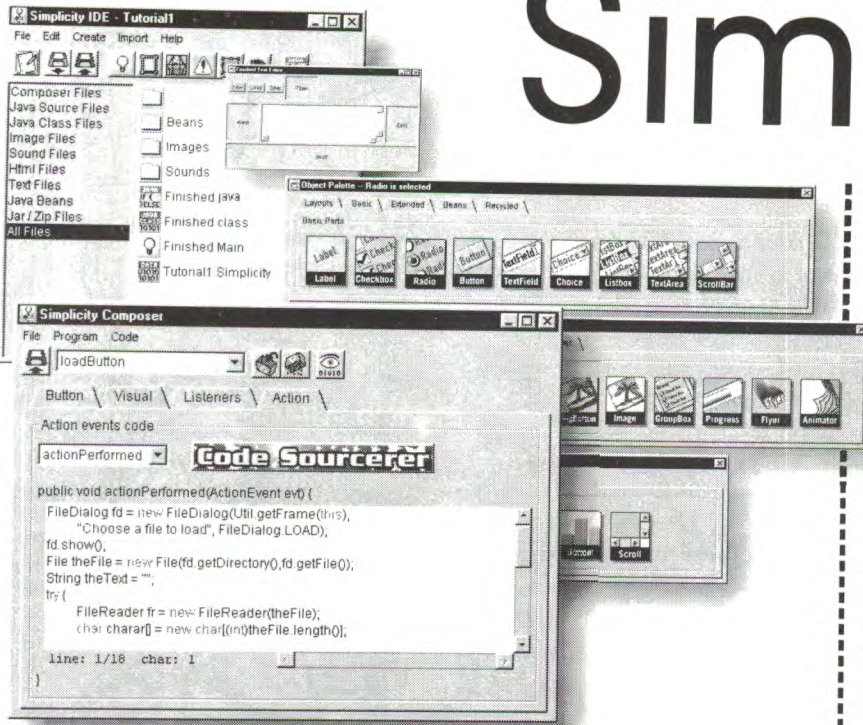
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